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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,073	12/13/2000	David J. Elliott	UV-102J	7710

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EXAMINER	
CROWELL, ANNA M	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/736,073	ELLIOTT ET AL.	
	Examiner	Art Unit	
	Michelle Crowell	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-20,23-29 and 34-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16-20,23-29 and 34-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 36 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 36 requires "a second fluid or vapor to the substrate". The specification fails to disclose this feature. On page 10, lines 3-5, the specification discloses one delivery pipe 21 and delivery nozzle 23 to supply process gasses.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1,7-13, 17-20, 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458).

Referring to Figures 3 and 10, column 3, lines 27-52, column 4, lines 22-36, and column 7, line 55 – column 8, line 17, Murakami discloses an apparatus which uses a rectangular ultraviolet laser beam 30 and reactive gas to deposit metallic film on the substrate 104. The apparatus includes a chamber 103, glass window 111 (UV window) located on the top of chamber 103, beam expander 107 (beam forming module), rectangular ultraviolet laser beam 106, gas inlet port 102 (gas injection module), gas exhaust port connected to exhaust gas treatment 117 (gas exhaust module), heater 125 (heating elements) and X-Y stage 112 for heating and securely holding the substrate (vacuum chuck), dichroic mirror 109 for adjusting the angle of the rectangular beam, laser oscillator 20 (UV radiation source raw output), and object lens 110.

In addition, while the gas inlet and outlet are stationary, the X-Y stage 112 moves the substrate 104 to the desired position for deposition.

Regarding Claims 7-13 and 25

The apparatus of Murakami is capable of administering the various claimed processes with the appropriate processing materials supplied. (i.e. etching reaction, deposition reaction, oxidation reaction, reduction reaction, melting reaction, reaction for modifying a

metallic or non-metallic film, polymerization or UV curing reaction, and doping reaction). Furthermore, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Murakami fails to specifically teach that the gas exhaust module is inside the chamber.

Referring to Figure 5, column 7, lines 25-53, Harada teaches a processing apparatus having a gas exhaust module 111 located inside the chamber to remove reaction gas products near the substrate and prevent process gases from diffusing outside of the processing region. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the exhaust module of Murakami inside the chamber as taught by Harada in order to remove reaction gas products near the substrate and prevent process gases from diffusing outside of the processing region.

6. Claims 2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458) as applied to claims 1,7-13, 17-20, 24-28 above, and further in view of Elliott et al. (U.S. 5,814,156).

The teachings of Murakami in view of Harada are discussed above.

Murakami in view of Harada fails to teach the wavelength of the UV radiation source raw output, energy level of the rectangular beam, optical elements, two cylindrical refractive elements.

Referring to column 4, lines 4-15, and column 5, lines 53-59, Elliott et al. teaches an apparatus which uses an ultraviolet radiation beam to clean (etch) the surface of a substrate. The laser source 22 provides a pulsed beam 24 (ultraviolet radiation beam) at wavelengths of 248 nm and 193 nm. Typical energy density levels at 248 nm range from 250-1500 mJ/cm^2 (0.25 – 1.5 J/cm^2). The laser source 22 further includes a beam expanding system 26 (beam forming module) made up of two cylindrical mirrors 54 and 56 (two cylindrical refractive elements). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Harada with the wavelength of the UV radiation source raw output, energy level of the rectangular beam, optical elements, and two cylindrical refractive elements as taught by Elliott et al. in order to ensure the appropriate wavelength and energy level necessary for the desired process. In addition, the cylindrical refractive elements (optical elements) create the rectangular beam in the desired dimension.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458) as applied to claims 1,7-13, 17-20, 24-28 above, and further in view of Schmidt et al. (U.S. 4,624,330).

The teachings of Murakami in view of Harada are discussed above.

Murakami in view of Harada fails to teach the dimensions of the rectangular beam.

Referring to column 2, lines 47-52, Schmidt et al. shows an ultraviolet beam 6 directed on vessel 1 with a length of 600 mm and width of 1mm.

In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only

difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Harada with the dimensions as shown by Schmidt et al. in order to ensure the appropriate dimension of the rectangular beam necessary for the desired process.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458) as applied to claims 1,7-13, 17-20, 24-28 above, and further in view of Giapis et al. (U.S. 5,002,631).

The teachings of Murakami in view of Harada are discussed above.

Murakami in view of Harada fails to teach a block shaped manifold.

Referring to Figure 1 and column 3, lines13-15, Giapis et al. teaches a valve-controlled aperture 103 (block shaped manifold) with pump used to exhaust out gaseous reaction products. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Harada with the valve-controlled aperture as taught by Giapis et al. in order for gaseous reaction products to be exhausted.

9. Claims 16 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458) as applied to claims 1,7-13, 17-20, 24-28 above, and further in view of Cates et al. (U.S. 5,204,517).

The teachings of Murakami in view of Harada are discussed above.

Murakami in view of Harada fails to teach a rectangular beam, a gas injection module and a gas exhaust module moving across a stationary substrate surface.

Referring to Figure 1 and column 8, line 41-column 9, line 25, Cates et al. teaches a rectangular beam 12, a gas injection module 62 and a gas exhaust module 65 moving across a stationary substrate surface by means of the robotic positioner 42 in order to move the processing region along a desired path of the substrate surface. Thus, it would have been obvious to one of ordinary skill in the art the time of the invention for the rectangular beam, the gas injection module and the gas exhaust module of Murakami in view of Harada to move across a stationary substrate surface as taught by Cates et al. in order to move the processing region along a desired path of the substrate surface.

With respect to claim 36 having a second fluid or vapor to the substrate, it should be noted that the type of gases or fluids used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas or fluid does not limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348, *Ex parte Thiabault*, 64 USPQ 666; and *Ex parte Masham*, 2 USPQ2d 1647. The apparatus of Murakami in view of Harada and Cates is capable of providing a second fluid or vapor to the substrate.

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458) as applied to claims 1,7-13, 17-20, 24-28 above, and further in view of Lee et al. (U.S. 6,374,770).

The teachings of Murakami in view of Harada are discussed above.

Murakami in view of Harada fails to teach an electronic control module.

Referring to Figure 1 and column 4, lines 46-50, Lee et al. teaches a CVD apparatus which uses a processor 34 operated by a computer program stored in memory 38 for a deposition reaction. The computer program selects the timing, mixture of gases, chamber pressure, chamber temperature, RF power levels, susceptor position, and other parameters of a particular process. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Harada with a processor as taught by Lee et al. in order to control various processing parameters to yield the optimum processing environment for deposition.

11. Claim 29 is under 35 U.S.C. 103(a) as being unpatentable over Murakami (U.S. 6,090,458) in view of Harada (U.S. 6,190,458) as applied to claims 1,7-13, 17-20, 24-28 above, and further in view of Mannava et al. (U.S. 5,174,826).

Referring to Figure 2, column 6, lines 15-31, Harada teaches a processing apparatus providing multiple gases 52 and 86 (a second fluid or vapor) to the substrate surface in order to deposit the desired film layer. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Murakami in view of Harada with a

second fluid or vapor to the substrate surface as taught by Mannava et al. in order to deposit the desired film layer.

Response to Arguments

12. Applicant's arguments filed May 27, 2005 have been fully considered but they are not persuasive.

Applicant has argued that Murakami fails to teach a rectangular beam or beam forming module; however, as seen Figure 3 the beam expander 107 forms the rectangular beam. It should be noted that in Drawing 2 of applicant's specification, the beam starts out rectangular and then narrows into a single point as in Murakami. The beam module of Murakami comprises beam expander 107 and dichroic mirror 109. Additionally, the shape of the claimed rectangular beam is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape of the claimed rectangular beam was significant. Furthermore, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)).

Applicant has argued that Murakami teaches away from a gas exhaust module inside the chamber and Harada has no clear suggestion or teaching at all; however, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of

the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or **in the knowledge generally available to one of ordinary skill in the art**. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Murakami with Harada is to have an exhaust module inside the chamber remove reaction gas products near the substrate and **prevent process gases from diffusing outside of the processing region** (col. 7, lines 49-53).

Applicant has argued that Murakami teaches a heater and not a vacuum chuck; however, on page 10 of applicant's specification, it simply indicates that the vacuum chuck 12 includes a heating element. Furthermore, it is well known in the plasma processing chamber art for the substrate to be held during processing by either a clamp ring, an electrostatic chuck or vacuum chuck. Thus, since the substrate 104 of Murakami is secured to the heater 125 and the description of a clamp ring or electrostatic chuck is not shown, it must be secured by a vacuum. chuck

Applicant has argued that Cates fails to teach a rectangular beam, a moving mechanism is in the chamber, and a motivation to combine; however, the purpose Cates was simply to demonstrate that it is known in the art to use a moving mechanism to move a beam forming module, a gas injection module, and an exhaust module. Murakami teaches a rectangular beam, and even if applicant thinks that Murakami fails to teach a rectangular beam, as stated above, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, then the claimed device was not

patentably distinct from the prior art device. Furthermore, the claims fail to require that the moving mechanism is located in the chamber, and in fact as seen in Figure 2 of applicant's specification, the moving mechanism for the beam module 30 is located outside of the chamber 13. Lastly, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or **in the knowledge generally available to one of ordinary skill in the art.** See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Murakami in view of Harada and Cates is to move the processing region along a desired path of the substrate surface.

Conclusion

13. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-F (9:30 -6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMC
08-13-05

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